5. A few Notes on the Whale *Balæna glacialis* and its Capture in Recent Years in the North Atlantic by Norwegian Whalers. By Prof. R. Collett, F.M.Z.S.

[Received December 12, 1908.]

(Plates XXV.–XXVII.*, and Text-figure 5.)

Whales captured 1889–1908.—In our own day, the Nordkaper is not known to have been observed within the Norwegian area. Since 1899, however, Norwegians have intermittently carried on whaling of this species in the sea to the east of Iceland and round the Faroe Islands, the Shetlands and the Hebrides, where the Nordkaper has appeared almost every summer in small companies, or sometimes in large schools.

In the course of twenty years, namely from 1889 to 1908, Norwegian whalers have in this way captured about 80 of these whales in the above-mentioned parts of the North Atlantic.

The numbers in the different years have been as follows :—

1889. In April the first specimen was taken on the European side of the Atlantic, to the east of Iceland. This was a female, with a total length of 43 feet (13·1 metres); the length of the head was 3450 mm. (thus being nearly one fourth of the length of the body).

1890. Seven specimens were taken round Iceland; a skull of one of these (total length 3920 mm.) and some baleen being preserved in the Christiania Museum.

1891. In all 10 specimens were killed off Iceland, several of them being caught about 50 miles to the west of that island. (Skeletons of these are in the Christiania and Bergen Museums.) One of them was a male, having a total length of about 47 feet (14·4 metres), the skull measuring 3910 mm. in length, or rather more than one fourth of the entire length of the body. Another was a female with a total length of 43 feet (13·1 metres).

1892. One specimen captured off the Faroe Islands.

1894. Two specimens captured off Iceland.

1897. Two specimens captured off Iceland, one of them being a female with a length of 46 feet (14 metres).

1898. One specimen taken near the Faroe Islands (a female accompanied by a young one).

1902. One specimen taken off Iceland.

1903. One specimen taken off the Faroe Islands, and three specimens off Iceland, four altogether. Among these

* For explanation of the Plates see page 98.

last was a female, taken in August (length 54 feet, or 16·4 metres), which contained a fœtus about 1 metre in length; another was scarcely more than a half-grown young one.

1904. Two specimens were captured to the south-east of Iceland.

1905. (One was wounded off St. Kilda, but escaped.)

1906. Six killed, and more seen (in company with *Balænoptera borealis*) off the Hebrides, between the 13th June and the 4th August.

1907. A large number seen, and 24 killed off the Hebrides. The latter were of both sexes; all the females were gravid.

Two specimens were also taken off the Faroe Islands, making 26 in all.

1908. Several hundred seen, and 20 killed off the Hebrides, between June 18th and July 9th. Those killed were of both sexes; none of the females were gravid.

Five specimens were also captured off Inishkea, Ireland, between June 8th and June 13th (among them one female and a young one), making 25 specimens in all.

Whaling in the Hebrides, 1906–1908.—The largest capture of Nordkapers in the present day took place during the past three years, when a single company (at Station Buneveneader, Harris), came across large schools of them in the sea off the Hebrides, and brought back 50 (6 in 1906, 24 in 1907, and 20 in 1908). About these I have received some particulars from the manager, Capt. Carl Herlofsen.

The six specimens in 1906 were taken on June 13th and 15th, July 18th and 31st, and August 4th (two on July 31st).

In 1907, the first two specimens were captured on June 13th. On June 15th another two were taken, and the rest later in the same month, ten in all; in July fourteen were captured, the last on the 26th July. The 11th July was a successful day, six whales being captured, four of them in the course of six hours.

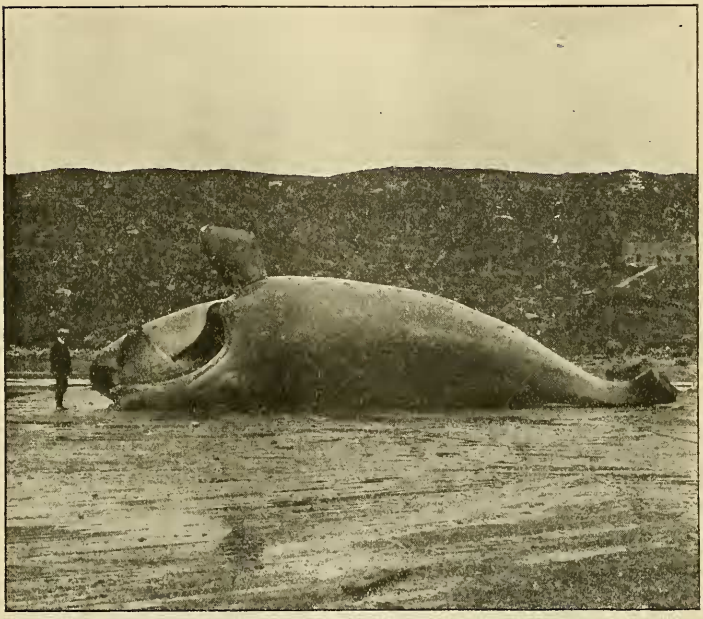
In 1908, on the 13th and 22nd June, two specimens were taken, the remaining 18 being taken between the 3rd and the 9th July. On two occasions five whales were killed in one day, namely on the 4th July (all males) and on the 7th July (three males and two females).

The five specimens that were killed the same year off Ireland had probably been on the whaling-ground at the beginning of June. On the first day of whaling, the 8th June, one Nordkaper was taken, and the remaining four were caught within the next few days. They were all separate, and no schools were observed.

Size.—Among the 24 specimens captured in 1907, males and females were in equal numbers; while of the 20 in 1908, twelve were males and eight females.

The specimens of the latter year averaged rather smaller than those of 1907. The females seem to be larger on the whole than the males; and the largest of all the specimens was a female, whose length was 50 feet (15·2 metres).

Text-fig. 5.



Balæna glacialis, male; from the Hebrides, July 6th, 1908.

The 24 specimens in 1907 were of the following length:—

Males (12).	Females (12).
English feet.	English feet.
48 (14·6 metres)	49 (14·9 metres)
47·5 (14·4 „)	48·5 (14·7 „)
47 (14·3 „)	48 (14·6 „)
46·5 (14·1 „)	48 (14·6 „)
46 (14 „)	47·5 (14·4 „)
46 (14 „)	47·5 (14·4 „)
46 (14 „)	47 (14·3 „)
45·5 (13·8 „)	47 (14·3 „)
45 (13·7 „)	47 (14·3 „)
45 (13·7 „)	46 (14 „)
45 (13·7 „)	44·5 (13·5 „)
43 (13·1 „)	44 (13·4 „)

Most of the 12 males thus had a length of from 46 to 47 feet, the average being 45·8 feet (13·9 metres).

Among the 12 females, the length was most frequently between 47 and 48 feet, the average being 47 feet (14·3 metres). In girth, the males measured 33·7 feet, the females 36·6 feet *.

The 20 specimens in 1908 were of the following lengths:—

Males (12).	Females (8).
English feet.	English feet.
47 (14·3 metres)	50 (15·2 metres)
47 (14·3 „)	49 (14·9 „)
47 (14·3 „)	47 (14·3 „)
46 (14 „)	46 (14 „)
46 (14 „)	43 (13·1 „)
46 (14 „)	43 (13·1 „)
46 (14 „)	43 (13·1 „)
44 (13·4 „)	31 (9·45 „)
42 (12·8 „)	
42 (12·8 „)	
37 (11·2 „)	
36 (10·9 „)	

Thus in 1908 the length of the 12 males was between 36 and 47 feet, the greater number of them being from 42 to 46 feet. The average length was 43·8 feet (13·3 metres).

Of the 8 females, one was 50 feet in length, and another, a young one, 31 feet, the remainder being between 43 and 49 feet. The average length this year was only 44 feet (13·4 metres).

The females in 1908 measured on an average 35 feet (10·6 metres) in girth, and the males 33·8 feet (10·3 metres), but the girth varied considerably. Among the males this year, there was one specimen that had a total length of 46 feet, and measured exactly the same in girth, namely 46 feet. Although it was not greatly inflated with gas (it had been dead only twenty-four hours), it was almost as round "as a ball" when it lay on the beach.

Colour.—There is no great difference to be found in colour between male and female.

A uniform black must be considered to be the typical colour, covering the entire body without any great differences of shade. In some specimens, however, more or less of the ventral surface was white. The boundary of this white colour was clearly defined against the black sides; in many specimens the white area was somewhat constricted in the middle, and in parts, especially towards the sides, was covered with oblong, black spots.

* Haldane, Ann. Scot. Nat. Hist., April 1908, p. 69.

The white-coloured belly occurred in both males and females.

Of the 6 specimens captured in 1906, one adult specimen and one young one were white-bellied. Out of the 24 captured in 1907, six specimens, or one fourth of the whole number, were white-bellied. Of the 20 specimens captured in 1908, only two were white-bellied (one male and one female). Thus 20 per cent. of the 50 specimens captured in the course of the last three years have been white-bellied.

None of the five specimens caught in 1908 off Ireland was white-bellied. The specimens were of both sexes, and the largest measured about 50 feet in length.

In the black colour on the belly in most, though not all, of the specimens, a large number of white stripes occurred, running in all directions, and measuring up to one metre in length and about 50 mm. wide. It is possible that these stripes may have been produced by the rubbing of the animal against the bottom when following the plankton-crustaceans upon which it feeds, and that they are of the same origin as those described in certain old specimens of *Mesoplodon bidens* and others.

The *pectorals* were black on the whole, both in the black- and in the white-bellied specimens, though often with a faint white marbling on the upper surface and the margin.

The *baleen* is black, both in the white-bellied specimens and in the black, though in some specimens a few of the foremost plates were white.

The number of plates was stated to be about 250 on each side. The bristles were also all black, and almost as fine as silk. One of the longest plates, which was presented to the Christiania Museum, measured 2225 mm. in length; the bristles were longest at the tip, where their length was 450 mm., but elsewhere measured about 250 mm. The longest plate that has been measured (Iceland 1903) had a length of 2700 mm.

The peculiar wart-like excrescences are situated in irregular rows along the upper and lower mandibles. The largest of these, as in *B. australis**, are at the tip of the upper jaw, where several sometimes join, and together form the largest "bonnet"; then one on each side of the tip of the lower mandible, and finally one immediately above each eye.

The *value* of a Nordkaper at the present time is from about 6000 to 10,000 kroner (£330 to £550). The blubber, which in some specimens is of a pale pink colour, has a thickness of about 260 mm. The amount of oil it contains varies from 10 to 30 barrels (of the first quality).

In the two young specimens mentioned above as captured in 1907, the blubber was pure white; the animals were exceedingly fat, and yielded about 30 barrels of oil each.

The weight of baleen in a full-grown specimen is from 250

* Lönnberg, Kgl. Sv. Vetensk.-Akad. Handl. B. 40, no. 5, p. 45 (Oct. 11, 1906).

to 330 kilogrammes, and is valued at about 6800 kroner (£375). From four full-grown whales, about one ton of baleen is obtained, which will thus fetch about 27,000 kroner, or £1500*. A single one of the longest plates of whalebone is worth about 38 kroner (£2 2*s.*).

Habits.—Every year of the whale-fisheries in the Hebrides, the whales kept almost to one place, always occupied in seeking food among the pelagic crustaceans. In 1906 they stayed nearly seven weeks, but they were then more scattered, and appeared more irregularly.

In 1907 they were on the ground for about six weeks, during which time they appeared sometimes separately, sometimes in small schools. The school that took up its quarters in this spot in 1907, consisted of at least 100 whales.

In 1908, the plankton-bearing currents probably flowed nearer land than in 1907, for the whales might be met with quite in the shallow water between islands and rocks. Their stay this year was of only three weeks' duration.

The schools this year consisted of several hundred, and, as already mentioned, the boats of the Station several times captured from two to five whales a day.

In 1907 the school was unaccompanied by any other species of whale; but in 1908 they came with hundreds of Rudolphi's Rorquals (*Balænoptera borealis*), which were just on their way north †.

The five specimens killed off Ireland in 1908 were also accompanied by *B. borealis*.

The Nordkaper is not timid, and is on the whole easy to approach. The harpoon used is a bomb-harpoon of the kind used in the Arctic Ocean. As the blubber is of considerable thickness, the harpoon should if possible be discharged at close quarters. If it strikes in the right place, the whale soon dies; but if it is only wounded, it becomes very violent in its movements, to the no small danger of the boats, although it does not attack them: it plunges round in the water like a ball and often gets the line wound several times round its body.

Notwithstanding the thick build of its body, it is able to bend it until the head nearly meets the flukes.

It is fond of lying quietly on the surface of the water; and it moves slowly, with its blow-holes above water. The jet these sent up could be seen from a considerable distance, and was about 5 metres in height. It was comparatively thicker than that of a Common Rorqual (*B. physalus*); a closer view shows it to be distinctly formed of two jets falling to different sides.

* The 24 specimens caught in 1907 yielded a total of rather more than 6 tons of baleen, of which the value was more than £9000 (163,000 kroner).

† *B. borealis* (Norwegian "Sei-hval") appears annually in larger or smaller numbers in the plankton-currents off the coasts of Tromsö and Finmark, generally staying from the middle of June to the middle of August.

As a rule, it blows five or six times in succession, and then remains under water for from ten to twenty minutes.

It dives almost perpendicularly, and therefore in diving shows the whole of the flukes. It sometimes leaps high in the water, but it has never been seen to leap quite out of the water.

It has never been heard to make any sound.

Its food, both in the Hebrides and off Iceland, was found to be exclusively pelagic crustaceans (the "krill" of Norwegian whalers), a Euphausiid about half an inch long, probably *Boreophausia inermis*.

Parasites.—All specimens were infested with thousands of *Cyamus* (the "lice" of whalers), which are especially found in the furrows of the excrescences along the jaws. They may also occur around the genitalia and scattered over the body.

Young.—Among the numbers that have frequented the waters round the Hebrides during the last three years, no small young ones were found. The three smallest captured had total lengths of 31, 36, and 37 feet (9·45, 10·9, and 11·2 metres). One of these young ones was white-bellied, and its baleen was of a lighter shade of colour than that of the black-bellied.

Propagation.—Three specimens were observed just before copulation on the 7th July, 1908. A female was lying on her back, and on each side of her lay a male with extended genital member, when the vessel came upon them and secured the female.

The twelve females killed in 1907, in June and July, in the Hebrides, were all gravid. The fœtuses were all more or less of the same size, having a length of from 1 to 1½ metre; their colour was always pale blue, with no trace of white on the under surface.

In the largest fœtus, the first rudiments of baleen had begun to appear.

In 1908, eight females were killed in the Hebrides, but, as previously stated, none of them was gravid. It is therefore possible that the gravid females go in separate schools.

There is also an account of a fœtus of about 1 metre in length found in the summer of 1903 off Iceland (in a female 54 feet in length, or about 16·4 metres).

From the above observations the following facts appear:—

Balæna glacialis may at present be met with in the summer in the North Atlantic in schools of 100 or more.

The length of most of the full-grown males captured in the years 1906–1908 was from 46 to 47 English feet (up to 48 feet), or from 14 to 14·3 metres (up to 14·6); that of the females generally from 47 to 48 English feet (up to 50 feet), or from 14·3 to 14·6 metres (up to 15·2 metres).

The greatest length was that of a gravid female, and amounted to 54 feet, or 16·4 metres (Iceland, 1903).

Of the 50 specimens captured in the summer of 1906–1908 in the Hebrides, about 10 per cent. were white-bellied.

Copulation may take place in the beginning of July, and gravid females have been found in June and July, with fœtuses of about 1 metre's length.

Their food in the summer months in the North Atlantic is (as far as has been observed) plankton-crustacea.

EXPLANATION OF THE PLATES.

PLATE XXV.

Balæna glacialis, male, from the Hebrides, July 8, 1908.

PLATE XXVI.

Balæna glacialis, male, from the Hebrides, July 6, 1908.

PLATE XXVII.

Balæna glacialis, female, white-bellied, from the Hebrides, July 6, 1908.

February 2, 1909.

FREDERICK GILLETT, Esq., Vice-President, in the Chair.

Mr. C. Tate Regan, M.A., F.Z.S., exhibited specimens of the Char of Lough Melvin (*Salvelinus grayi*, Günth.) and of the Char from a little loch under Ben Hope, Sutherlandshire, recently described by him under the name *Salvelinus maxillaris*. He pointed out the differences between the two forms, and called attention to the interest attaching to the study of this too much neglected group of British freshwater fishes.

Mr. R. E. Holding exhibited several skulls and photographs of the St. Kilda or Hebridean Four-horned Sheep, and made the following remarks concerning the horns in this variety:—

"That there are several well-defined breeds of the domesticated Sheep which carry normally four horns is now well known.

Explanation of Text-fig. 6 (see opposite).

A. Head of St. Kilda Ram, showing wide type of the horns. Length of upper horns 18½ inches each.

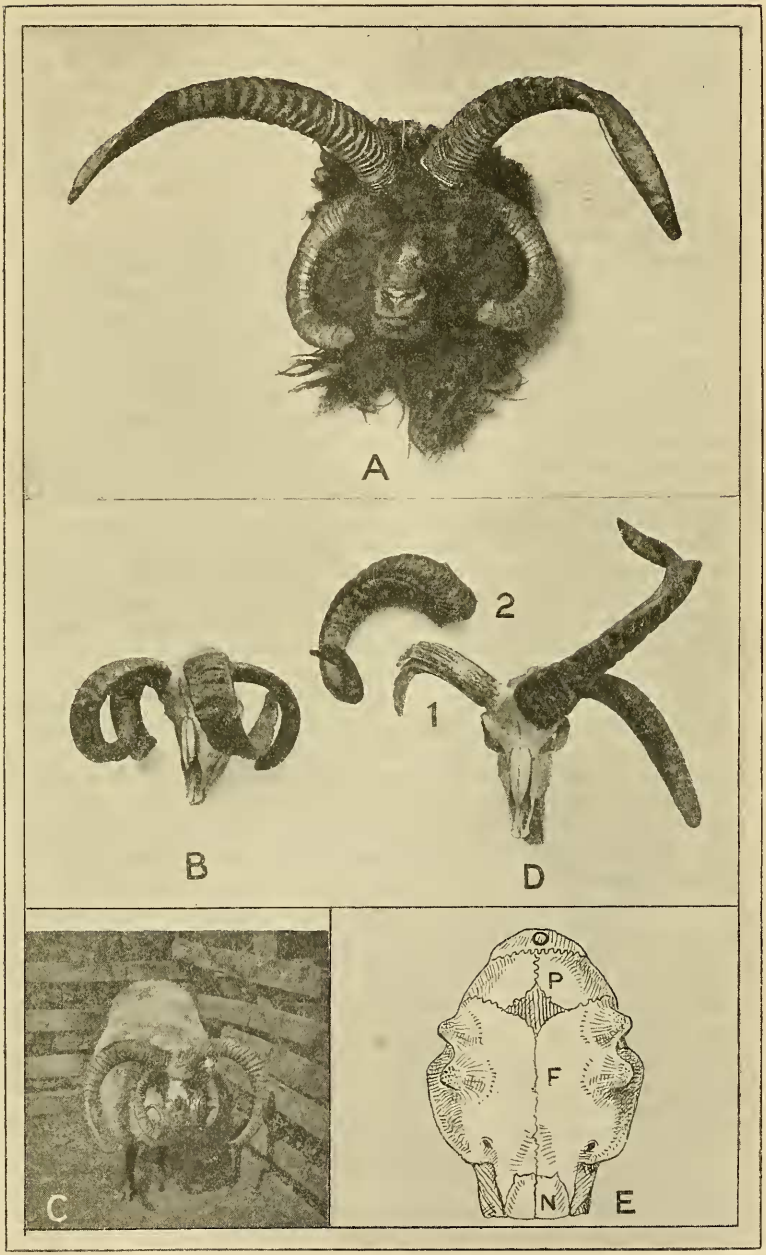
B. Ditto, showing the narrow or more contracted type. The upper horns forming almost a complete circle; in both specimens the lower horns had to be cut to prevent their growing into the jaw.

C. Photograph from life (by E. M. Machugh) of an exceptionally good head of a well-known Scotch black-faced four-horned breed, which was established some thirty years ago from an odd Ram Lamb which occurred in the flock. The owner taking some interest in the matter, was enabled by selection to cause the variety to become permanent, some remarkable heads being the result.

D. Skull from the same flock as B, showing two separate horn-pedicles or supports (1), covered by one sheath (2), indicating that these supernumerary horns have their origin in duplicated centres of the frontal bone. The upper left pointing backwards is an unusual variation.

E. Upper part of the skull of a St. Kilda Ram Lamb at six weeks old, showing an early stage in division of the bony pedicle which supports each horn. O, occipital; P, parietal; F, frontal; N, nasal.

Text-fig. 6.



Heads etc. of Four-horned Sheep.

The St. Kilda or Hebridean and the South-African varieties are the better known, but there are also an Indian variety, of which several specimens are living in the Society's Gardens, having some slight variations, and a local breed of the well-known Highland "Black face," which also bear four horns. The St. Kilda is entirely black, the fleece being dark brown; the South-African form is piebald on the face and legs, with black irregular marks on the fleece; the Indian has spotted face and legs and white or grey fleece; and the Scotch variety has characteristic face-markings and long-stapled wool.

"Although at first there seems to be a somewhat perplexing irregularity in the form and pitch, as it were, of the horns of these Sheep, there can, I think, be seen a fairly constant type which separates the horns of the St. Kilda Sheep from those of other varieties. Upon looking over a considerable series, it is apparent that there are two distinct types—one in which the median horns are directed well forward in a semicircular curve, as in A, text-figure 6 (p. 99), and the other, B, in which the median horns take a much smaller curve over the face. I have not noticed an intermediate stage in this breed. The lateral horns spring at almost right angles from the skull, and grow at times so close inwards that the points would penetrate the skull if not cut. The median horns of the South-African variety are usually erect, or, if curved, take a backward inclination, rarely directly forward as in the St. Kilda form. The lateral horns are also of wider curve, and so grow clear of the head. The Highland variety follows very closely the Hebridean form, as shown in C.

"In the same flock of St. Kilda Sheep some variety may occur in the number of the horns, as indicated by D, which come from the same source as A.. This is apparently due, not to any arrest in the growth of the bony horn-bearers, but to their fusion under a single horn-sheath, as indicated by the specimen. These super numerary horns are not due to an antero-posterior cleavage, *i. e* from apex to base, but to segmentation of the centres of ossification of the frontal bone, as indicated by the skull of a Lamb, E, at six weeks old."

Mr. Malcolm Maclaren, through Mr. C. Davies Sherborn, F.Z.S., called the attention of the Fellows to an account of a fight between a Whale and a Swordfish observed by the crew of the fishing-boat 'Daisy' in the Hauraki Gulf, between Ponui Island and Coromandel, as reported in the 'Auckland Weekly News,' 19th Nov., 1908. A cow whale and her calf were attacked by a 12 ft. 6 in. swordfish, the object of the fish being the calf. The whale plunged about and struck in all directions with her flukes. Occasionally the fins of the swordfish were seen as he rose from a dive, his object apparently being to strike from below. For over a quarter of an hour the whale circled round her calf, lashing furiously and churning up the water so that the assailant was unable to secure a good opportunity for a thrust. At last,

after a fruitless dive, the swordfish came close up and made a thrust at the calf, but received a blow from the whale's flukes across the back, which apparently paralysed it. It was killed and hauled on board the boat without difficulty, while the whale and calf went off towards Coromandel with splashings and plungings. The whale's blow had almost knocked off the back fin of the swordfish and heavily bruised the flesh around it. No threshers accompanied the swordfish.

Dr. C. W. Andrews, F.R.S., F.Z.S., gave the following account of his visit to Christmas Island in 1908, and illustrated his remarks with lantern-slides :—

"Christmas Island in the Indian Ocean (S. lat. 10° 25′, E. long. 105° 42′) lies some two hundred miles south of Java, which is the nearest land. It has an area of about forty square miles, and its highest point is 1200 feet above the sea-level. The island consists mainly of coral-limestones resting on a basis of volcanic rock interstratified with foraminiferal limestones; the whole surface is thickly covered with forest and jungle. The fauna and flora of this isolated spot have been the subjects of numerous papers, a list of which up to the year 1900 is given in the 'Monograph of Christmas Island,' a volume which contains a detailed account of the collections which were made by me during my former visit in the years 1897–8. Since that date the island has been visited by Messrs. Ridley and Hanitsch of Singapore, and the former has published an interesting account* of the flora, to which he was able to make a considerable number of additions. Almost up to the date of my first visit the island had been uninhabited, and was only visited by ships on very rare occasions; but since then, owing to the quarrying and export of the valuable deposits of phosphate of lime, a considerable population has been imported, and many ships call either to bring stores or to ship cargoes. The consequence of this is that many animals and plants have been introduced from time to time, and it was for the purpose of investigating the effect of these introductions on the native flora and fauna that, at the suggestion of Sir John Murray, I revisited the island in the autumn of last year, remaining there about three months. The changes that have taken place are, as might be expected, chiefly noticeable in the immediate neighbourhood of the settlement and quarries, while the rest of the island, although traversed by roads in several directions, is practically unchanged. To this general statement there is, however, at least one important exception, and that is that the two species of native rats seem to have become totally extinct. At the time of my former visit these animals swarmed over the whole island, one, *Mus macleari*, being found practically every-

* "The Botany of Christmas Island," Straits Branch, Royal Asiatic Society Journal, June 1906, p. 121.

where; the other, *Mus nativitatis*, more adapted for burrowing, was for the most part confined to the higher ground. Last year, in spite of continual search, not a single specimen of either species could be found in any part of the island. This complete disappearance of two such common animals seems to have taken place within the last five or six years, and to have been the result of some epidemic disease, possibly caused by a trypanosome, introduced by the ship-rats. These are a variety of *Mus rattus*, and have been introduced in considerable numbers, though they do not seem to have spread to the remoter parts of the island at present, at least to any great extent. The disappearance therefore of the native forms cannot be due to direct competition with the intruders, but must be the result of disease, a conclusion supported by an observation made by the medical officer, Dr. McDougal, who told me that some five or six years ago he frequently saw individuals of the native species of rats crawling about the paths in the daytime, apparently in a dying condition. I hope that it will be possible to obtain information as to whether any trypanosome or other pathogenic organism occurs in the blood of the imported rats.

"Of the other native mammals the shrew (a variety of *Crocidura fuliginosa*) is probably also extinct, at least no specimen was either seen or heard during my visit. The large fruit-bat (*Pteropus natalis*) is more numerous than formerly, at least near the settlement, probably in consequence of the much larger number of fruit-trees now to be found there. Cats have been introduced, and are becoming numerous; in some cases they have taken to the woods, and occasionally cause great destruction among the poultry which are reared in large numbers.

"The native land-birds all seem to be as numerous as formerly. The large fruit-pigeon (*Carpophaga whartoni*), which is used for food, is protected during the breeding-season, and at other times the number killed is limited so far as possible. These birds have not yet acquired any fear of man, and allow themselves to be snared by hand as easily as ever. The frigate-birds do not nest in the neighbourhood of Flying Fish Cove in anything like such numbers as formerly, but are still very numerous elsewhere. The yellow tropic-bird (*Phaethon fulvus*) seems to have increased in numbers. No introduced bird has obtained any footing on the island.

"No changes of importance were noticed among the native Invertebrates; but the large *Scolopendra*, of which a very few individuals were noticed during my first visit, is now much more numerous. Probably many insects have been introduced, but until my collections have been fully worked out, nothing can be said on this point.

"A large number of plants have been introduced, and probably the clearing of the forest and cutting of roads will enable them to spread much more rapidly in the future than they have done in the past. Already the papaia and chillies have extended